Ocean Science Discussions

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Comment on os-2021-81

Anonymous Referee #2

Referee comment on "The capabilities of Sentinel-MSI (2A/2B) and Landsat-OLI (8/9) in seagrass and algae species differentiation using spectral reflectance" by Abderrazak Bannari et al., Ocean Sci. Discuss., https://doi.org/10.5194/os-2021-81-RC2, 2022

As the title suggests, this manuscript discusses the ability of satellite spectral sensors to distinguish seagrass and algal species – in shallow waters. Laboratory experiments simulated the marine conditions using field-collected samples in various combinations and proportions of coverage. Results indicate that as much spectral information as possible is beneficial to discrimination between species but the two satellite-borne sensors (MSI, OLI) are closely comparable and can be used jointly. Nevertheless severe challenges to species discrimination remain. The topic and monitoring ability are important given the growing recognition of seagrass and algae in the marine ecosystem and carbon cycling. This importance is described at length in the Introduction. There is also extensive description of the "state of the art" in the Introduction and following ". . review" section. The objectives are given towards the end of the Introduction (lines 123-126), i.e. before the review which therefore curiously provides no input to the objectives. Indeed the review provides much detail but little synthesis or rationale for what work is now wanted. Section 3.5 lines 373-411 is more description of the "state of the art" and appears misplaced.

The last paragraph of the Discussion (lines 765 to 785) begins "These results corroborate the finding of Wicaksono et al. (2019) . ." and carries on with other corroborations to line 779. There needs to be more emphasis on how the results from this manuscript are new or more robust.

The authors appear to be extremely well-versed in the topic and I have no reason to doubt the methodology or validity of results. These are significant albeit somewhat disappointing for the stated purpose.

The work should be published in due course. However, this manuscript is very long and I think the authors need to consider what content is really needed to support their results. Incidental material can obscure the "message".

Detailed comments

Abstract. This is what most potential readers will use to decide whether they want to read more. It needs to be appealing to a broad range of readers. The present abstract is too long and "technical" to be appealing. Less methodology and more emphasis on results would help.

Line 11 and many places later. The meaning of "homologous" needs definition because it is not in general use or specific to spectral bands. The definition is best in the main text and use of such a technical word should be avoided in the abstract.

Line 18 and many places later. "clear" tends to mean transparent, probably not the intended meaning. The opposite of "dark" is "pale" or perhaps "light". Later you also use "bright" which I suppose means very light-reflective and is OK.

Line 186. "very high pixel size and narrow spectral resolutions". Wrong adjectives (high, narrow). Are the pixels large or small? Is the spectral resolution fine or coarse?

Line 192. Delete "high".

Equations 2 to 10. Where are the wave-length ranges of the various bands NIR, red etc. defined?

Lines 529-530 and Figure 7. The caption (rather than the main text) should explain the other coloured lines in panels e, f, g, h, and that the % refer to coverage (which need not be repeated for every item in the figure).

Line 682. "absorption characteristics become very narrow" – I think "narrow" is the wrong word. Maybe "absorption characteristics are all very similar"?

Line 695. "pure and homogenize species" – "homogenize" is a verb, meaning additional to "pure" is unclear.

Line 783. “Nevertheless” gives the wrong relation to the previous sentence. Maybe better “Green rather than blue band integration may be preferable due to its better sensitivity . . scattering.”